

Course Syllabus
Sauk Valley Community College
173 Il. Rt 2, Dixon, Illinois 61021



Class Name and Number

General Chemistry I, CHE 105

Course Description/Credit Hour/Prerequisites

A. This course involves the study of matter, measurements, the periodic table of the elements, atomic structure, basic concepts of quantum theory, bonding, stoichiometry of compounds and reactions, solution chemistry, introduction to acids and bases, thermochemistry, the gaseous state, and basic concepts of the liquid and solid states. This class is for chemistry, engineering, premedical, and science majors.

B. Number of Hours Per Week: 4 lec, 2 lab for 5 credits

C. Prerequisite: One year of high school chemistry or CHE 103 – Introduction to Chemistry (with lab) or CHE 102 – Introduction to Chemistry (lecture only)

Meeting Times and Location

M, W; 11:00 am; Room 1K4

Instructor and Office

David Edelbach

Office: 3H14

Office phone: (815)835-6364

email: david.j.edelbach@svcc.edu

Office Hours:

M 10-11, 12:30-1:30

Tu 1:30-2:30

W 10-11

Th 10:30-12:30

Materials

Chemistry Principles and Reactions, by Masterton, Hurley, and Neth 7th edition, Brooks/ Cole Cengage Learning, 2010.

Laboratory Studies for General Chemistry I, by David Edelbach, 2011 edition.

Optional: Chemistry Student Solution Manual by Masterson, 7th edition, Brooks/ Cole Cengage Learning, 2010.

Grade Determination

1. Exams

- a. four unit exams worth 100 points each
- b. comprehensive final worth 200 points
- c. Exam dates are announced in class.

2. Missed Exams

- a. If you miss an exam the percentage from the comprehensive final will be used as the percentage for the missed exam. Talk to me if you miss more than one exam.
- b. If no exams are missed 10 points will be added to your total number of points.

3. Quizzes

There will be daily quizzes. All quizzes combined are worth 125 points. The three lowest quiz scores will be dropped. No make up quizzes will be given. In the interest of time, short quizzes will be given and only 5 minutes will be allowed to complete the quiz. This should be enough time if you know the material. Quizzes will be given at the beginning of the class. Being late to class will reduce the amount of time you have for the quiz by the number of minutes you are late.

4. Laboratory

Laboratory will contribute 25% to the overall course grade.

5. Final grade will be based on percentage of total points obtained.

90-100% A, 80-89% B, 70-79% C, 60-69% D, < 60% F

6. No points will be given for attendance.

Studying

- Review class notes.
- Rework problems done in class.
- Work assigned problems.
- Be able to do the items listed on the objective sheets.

Outcomes

A. Matter and Measurements

Students will define terms used to discuss matter and measurements; classify matter, properties and changes; indicate appropriate SI units; record answers with the correct number of significant figures; work problems involving percentage; perform conversions; work problems involving density.

B. Scientific Method

Students will describe the scientific method, distinguish between observations and conclusion, distinguish between laws and theories, formulate hypotheses, design and carry out experiments to test hypotheses, draw conclusions using data obtained from experiments.

C. Atoms, Ions, Molecules

Students will describe the experiments used to discover the structure of the atom; give the properties for subatomic particles; indicate the atomic number, mass number, and the number of proton, electrons, and neutrons given and elemental symbol in the form ${}^AX^{\text{charge}}$; distinguish between structural, molecular, and empirical formulas; work quantitative problems involving the relative abundance of isotopes and the average atomic mass; name and provide formulas for ionic and molecular compounds and acids.

D. Chemical Reactions and Stoichiometry

Students will determine the empirical and molecular formulas for compounds given various types of data; complete and balance precipitation and neutralization reactions; work stoichiometry problems; calculate the masses of individual atoms and molecules; work problems involving molarity and solution preparation; classify reactions as redox or non redox and balance redox reactions using the half reaction method.

E. Gases

Students will describe the relationship between temperature, pressure, volume, and number of moles of a gas; work problems using the ideal gas law; work quantitative problems involving gas mixtures; work stoichiometry problems involving reactions occurring in the gas state including those involving collecting gas over water; explain the behavior of gases using the KMT; describe the difference between effusion and diffusion, those factors affecting effusion and diffusion rates, and work problems using Graham's law of effusion; describe the difference between a real and ideal gas and indicate those conditions under which real gases behave most ideally; describe our atmosphere in terms of composition, structure, and types of air pollutants and their sources and formation; outline the greenhouse effect.

F. Electromagnetic Radiation and Electronic Structure

Students will calculate frequency, wavelength, and energy per photon; list the components of the electromagnetic spectrum in order of increasing wavelength, frequency, or energy per photon; describe emission, absorption, and continuous spectra, will indicate what conditions are required to produce each, and will explain their formation at the atomic and molecular level; work problems involving the Bohr model of the hydrogen atom; describe the quantum mechanical model of the atom; write electron configurations for atoms and ions and indicate the number of unpaired electrons; list atoms and ions in order of increasing size, ionization energy, and electronegativity.

G. Bonding

Students will classify bonds, write electron dot structures, assign formal charges, predict molecular shape and bond angles, give hybridization, and indicate the overall polarity of molecules or ions, describe the characteristics and formation of pi and sigma bonds.

H. Thermochemistry

Students will describe the source of energy changes in chemical reactions and draw energy diagrams for both exothermic and endothermic reactions; calculate Enthalpy changes for reactions using Hess's law, heats of formation, bond energy, or experimental data; work quantitative problems involving heat capacity.

I. Condensed State

Students will describe the nature and relative strength of hydrogen bonding, dipole forces, and dispersion forces; predict the predominant intermolecular force present in a compound; predict physical properties based on structure; draw and label a cooling curve for a pure crystalline substance; describe the difference between ionic, molecular, metallic, and network covalent solids in terms of bonding and general properties; classify solids; describe phase changes and use phase diagrams.

Tentative Weekly Schedule

Week	Chapters
1-3	1, Matter and Measurements (15%): matter, properties, changes, SI units, significant figures, percent calculations, conversions, density, scientific method
	2, Atoms, Ions and Molecules (5%) discovery of atomic structure, atomic structure, subatomic particles, types of formulas; isotopes, atomic mass, nomenclature
	Test, Chapters 1,2
4-6	3, Stoichiometry (10%) determination of empirical and molecular formulas, mole, stoichiometry for compounds and chemical reactions, limiting reagent, percent yield
	4, Reactions in Aqueous Solutions (10%) double replacement reactions, molarity and solution preparation, solution stoichiometry, redox reactions
	Test, Chapters 3,4
7-10	5, Gases (10%) gas laws, ideal gas law, Dalton's law of partial pressure, stoichiometry and gases, kinetic molecular theory, effusion and diffusion, Graham's law, ideal vs real gases, atmosphere, pollution, greenhouse effect
	6, Electronic Structure and Bonding (15%) light, electromagnetic radiation, electromagnetic radiation, spectra, Bohr model, quantum mechanical model, electron configurations, periodicity
	Test, Chapters 5,6
11-14	7, Bonding (15%) ionic and covalent bonds, Lewis structures, formal charges, VSEPR, bond hybridization, molecular polarity, sigma and pi bonds
	8, Thermochemistry (10%) exothermic and endothermic reactions, Enthalpy changes, Hess's law, heats of formation, bond energy, heat capacity, calorimetry
	Test, Chapters 7,8
15	9, Liquids and Solids (10%) Van der Waals forces, predict physical properties and molecular structure, phase changes, cooling curve, types of solids, phase diagrams
	Final, Comprehensive, Chapter 1-9

Grading & Make-up Policy

SVCC believes that graded material must be turned in on or before the deadline that is set by the instructor. Failure to turn in work as scheduled may result in a zero or some other penalty indicated by the instructor.

Withdrawal Policy

SVCC has a college wide withdrawal policy found at <http://www.svcc.edu/students/right-to-know/withdrawal.html>. Students not following the policies found within this syllabus are subject to withdrawal at any time by their instructor.

Incomplete Grade

SVCC understands that sometimes it is impossible to complete a course due to an unforeseeable circumstance. With instructor approval, the Incomplete grade (I grade) allows a student to make-up a major exam or project after the semester has officially ended. The Incomplete grade is not designed to be used in place of a Withdrawal (W grade) and is only used in the discretion and approval of your instructor and the college's Academic Dean or Academic Vice-President. The instructor and the student must complete an incomplete contract that the instructor will provide to you.

Attendance Policy

SVCC believes in the importance of attending and being on time for scheduled classes. This reflects the personal responsibility required of each citizen in work, social, and community settings. If students must miss a scheduled class or be late, it is their responsibility to notify instructors.

Civility/Etiquette

SVCC believes that all students should feel free to participate fully during their own learning experience; however, impolite or distracting behavior detracts from the learning experience of others and has no place in the classroom. Therefore, respectful, considerate, and active participation is expected in all classrooms and school settings. In addition, students should be receptive to instructor feedback and new ideas.

Use of Technology

Students should turn off all electronic devices while in the classroom unless they have the consent of the instructor. Electronic items include, but not limited to cell phones, lap tops, tablets, MP3 players, and voice and video recorders. Students violating this policy may face college disciplinary action. Also, students are subject to the SVCC [Acceptable Use Policy](#). Any violations of that would be handled at the institution level.

Cheating & Plagiarism

Students that are caught cheating or having plagiarized will be subject to disciplinary action including academic expulsion.

Moodle

Grades will be posted on Moodle. To access Moodle, log onto www.svcc.edu. Under "Quick Jump" select "Moodle." Your UserID is your first name.middle initial.last name (for example steven.j.smith). The first time you login, your password will be sv followed by the last four digits of your college ID number (for example, sv3456). You may change your password at any time after you login. If you need technical support, send an email to support@svcc.edu or call the IT help desk at 815/835-6292.

Assessment

Sauk Valley Community College is an institution dedicated to continuous instructional improvement. As part of our assessment efforts, it is necessary for us to collect and analyze course-level data. Data drawn from students' work for the purposes of institutional assessment will be collected and posted in aggregate, and will not identify individual students. Your continued support in our on-going effort to provide quality instructional services at SVCC is appreciated.

Privacy

The College policy on student records complies with the "Family Educational Rights and Privacy Act." This Act is designed to protect the privacy of education records, to establish the rights of students to inspect and review their education records, and to provide guidelines for correction of incorrect or misleading data through formal and informal hearings. A copy of the Act or questions concerning the Family Educational Rights and Privacy Act may be referred to the Dean of Student Services, Ext. 271.

Disability

If you have a disability or suspect that you have one and want to request a classroom accommodation, it is your responsibility to contact the Student Needs Office. The accommodations will be made after verification is received by the Student Needs Coordinator and an intake interview is completed. Student Needs Office phone is 815-835-6246, and located in Room 1G4.

Notification of recording

All classes at Sauk Valley Community College may be recorded for a variety of reasons to include compliance with the American with Disabilities Act in providing reasonable accommodations to person with disabilities. By enrolling in this course, students hereby consent to recording of classes.